

SPECTRUM

RESEARCH AT THE UNIVERSITY OF ALBERTA



Understanding the customer

Research takes real-life approach

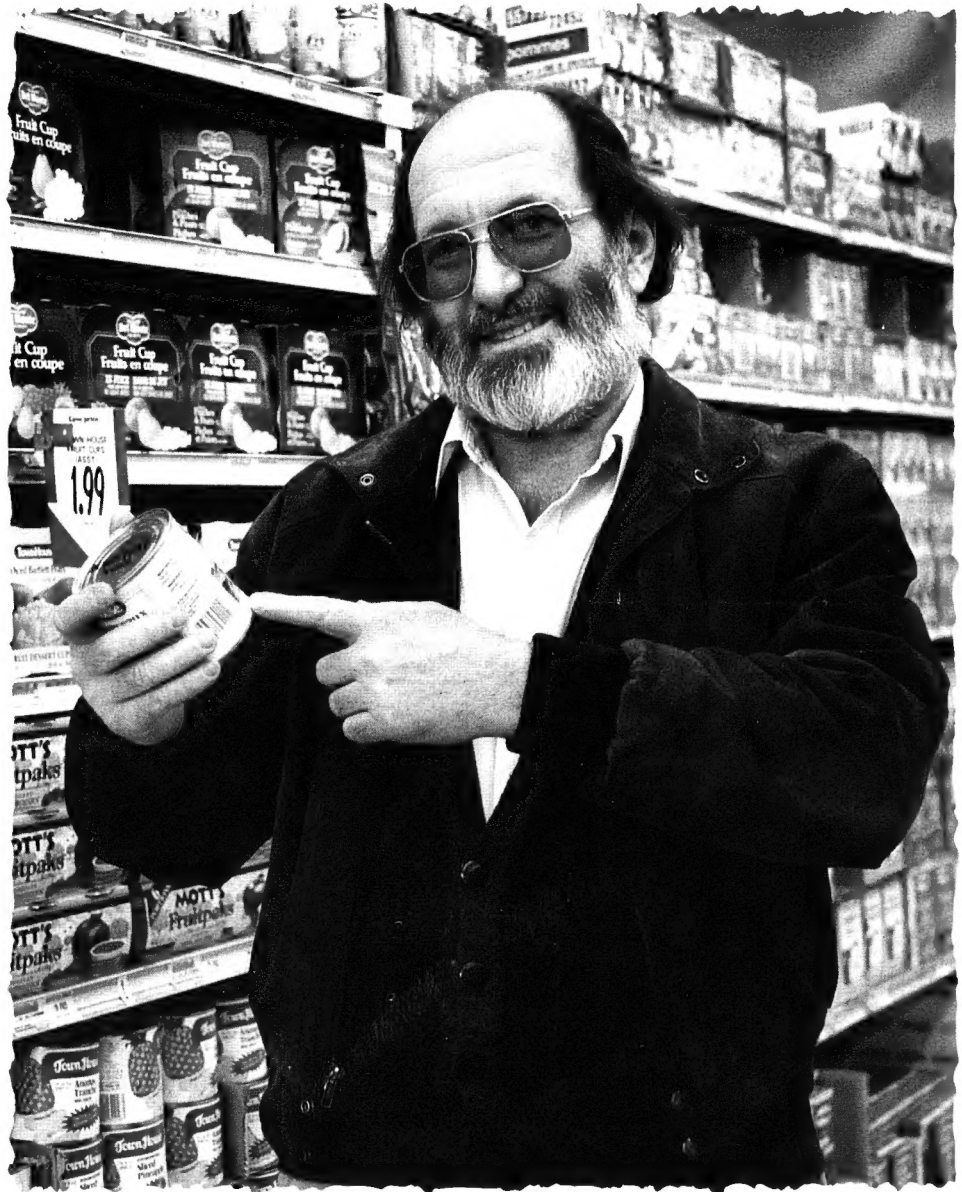
Picture this: all of a sudden the automatic scanners don't work. The line-ups at the grocery store come to a screeching halt. Shoppers wait, and wait, and still nothing happens. They get restless. Some leave, some hurl abuse at store employees, all of them are mighty angry — except for one person who seems to actually enjoy the experience. What's with this guy?

For Adam Finn, business professor and retail industry expert, the delay was an opportunity to do a bit of research.

"It was very interesting, waiting in that line," says Dr Finn. "I started to think about how management could be handling the situation. What is the value in keeping long-term customers happy, people who spend \$80-\$100 a week in this store? Rather than having people not shop in the store any more because of this experience, perhaps it would have been better to ask customers to pay what they thought their groceries were worth and absorb the loss."

Dr Finn discussed this episode at the next meeting of the Canadian Institute of Retail and Services Studies. (He is the director of CIRASS.) The institute's partners — national retailers, developers of retail properties, and regional and local businesses — were interested in hearing Dr Finn's perspective on customer service in an emergency situation. This interaction between academia and business is central to CIRASS, which does research on contract for individual companies as well as more basic research of general interest to retailers.

One example of Dr Finn's research is a current study of the market research techniques used to collect data on the retail choices consumers make. The focus is on grocery shopping and involves testing how well the different techniques can predict customer response to a new type of grocery store.



Adam Finn offers new perspectives on customer service.

"The traditional approach to understanding what customers want is to try something new and see what business is like," Dr Finn says. "This is OK if all you're doing is putting a store in a mall. You would put in the fixtures and the stock, and if the store wasn't a success you would terminate the lease and liquidate the assets."

"But these are the days of the mega-store. The amount of investment in a single store like Eagle Hardware is huge and the risk is high. Consequently, retailers need to be much more certain about location and price levels."

To get information about customer preferences, standard surveys ask re-

Continued on next page

Social power of music

It is at the heart of culture

The questions, always the questions ... they were what sidetracked music professor Regula Qureshi from a career as a cellist. She was set to become a performer, but her inquiring mind took her down another path.

"Why is music powerful? Why is music important? Those are the kinds of questions that led me into academia and they interest me still," Dr Qureshi says. "I've experienced the emotive and social power of music first-hand. I want to explore this aspect and, at the same time, look at the place of music in society — who produces it, who appropriates it."

Dr Qureshi's speciality is ethnomusicology, the study of music in a sociocultural context. She explores the connections between music and other facets of life such as economics and religion. Her research interest is the classical music of India, in particular that of the sarangi, India's only indigenous bowed fiddle.

"My work focuses on the traditions of the instrument, its performers and history, and also the uses of the music by the performers and those who hear the music," Dr Qureshi explains. "I'm looking at the 'conversations' the music creates and what they say."

For Dr Qureshi, understanding those conversations is not a purely academic pursuit. Her lectures, seminars and conference papers are usually accompanied by her performing (on the sarangi) some of the music she talks about. "I need to be in touch with the experience of performing to know what works and what's important," she says. "It's the only way I can authenticate my insights."

While at first glance Alberta may seem like an odd place from which to study Indian music, Dr Qureshi notes that there are many benefits to cross-cultural connections.



Performing keeps Regula Qureshi in touch with what's important in her research.

For example, at a recent conference on the sarangi, Indian scholars were eager to learn about music education in Canada. And Dr Qureshi says there's a lot we can learn from India about how to keep musical traditions alive.

"The power of music to engage individuals strongly touches me very personally," she says. "And yet we don't have to be physically close for music to create a community. In today's polyglot, multicultural states, people are struggling to keep their identity. Music is a way of connecting, a real social power."

"At the same time, music is a non-threatening doorway into other communities. I think that's what draws many students to study world music. They appreciate that it is an opportunity to 'turn their heads around' and make them culturally aware. Once you step outside your culture, you never look at your own in the same way."

Dr Qureshi's research has received support from the Shastri Indo-Canadian Institute, the Secretary of State and the Social Sciences and Humanities Research Council. ▢



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Consumer

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spondents to rate various features, usually on a scale from one to five. The effectiveness of this technique is being tested, along with a novel alternative which gives respondents descriptions of hypothetical stores and asks them which one they would choose to shop in.

"This approach emphasizes choice over rating," Dr Finn explains. "I think it is much closer to the way people operate in real life. They don't rate things in their minds, they make choices."

Analysis of the techniques is under way. Models developed from data collected in 1992 are now being tested to see how well they predict the results of surveys done in 1993.

The Social Sciences and Humanities Research Council supports the study. ▢

Making sense of MS "hotspot"

Why the higher risk in Alberta?

While there are many things a province would want to be famous for — a booming economy, fantastic weather — one of them is definitely not an extremely high prevalence of multiple sclerosis. Unfortunately, Alberta is one of the world's hot spots when it comes to this debilitating

"... it often takes a long time to solve epidemiological puzzles. My reward comes from trying to contribute to solving the puzzle."

autoimmune disease in which the body's immune system mistakenly attacks the insulating cover around nerve fibres.

An incidence of about 30 MS cases per 100,000 people would be considered high; Alberta has about 200 cases per 100,000 people. It's true that the farther from the equator one goes, the more prevalent MS becomes. But Alberta's incidence is much higher than the trend would predict.

There's a puzzle here, one that rehabilitation medicine professor Sharon Warren is eager to solve. As an epidemiologist, one of her research specialties is investigating MS incidence and its risk factors.

"Once we determine the incidence of a disease like MS we can start to look at risk factors," Dr Warren explains. "Many researchers have studied the north-south

gradient, but they haven't had much luck in determining why high latitudes have more MS. The latitude pattern is a clue; we just don't know what it means."

Other clues may come from lifestyle and behavioural factors, an area Dr Warren has covered in her research. In some people, MS symptoms come and go, but others get a chronic and progressive form of the disease. Can behavioural factors be used to predict how the disease will progress?

"From our work it appears that, in general, lifestyle is not a good predictor of how disabling MS will be," Dr Warren says. "There does, however, appear to be two 'constellations' of the disease: men who get MS at age 40 or later and it affects their motor functions, and women who get MS earlier and it affects sensory functions. It appears that the later the onset of MS, the more disabling the disease."

Other aspects of MS point to a genetic susceptibility. Some ethnic groups within high prevalence geographical areas have a very low incidence of MS. North American Indians and Inuit are two examples. Studies of fraternal and identical twins also indicate a genetic component.

To further study the genetic link, Dr Warren is now collaborating on a cross-Canada study that looks at the family history of MS patients. All MS patients in Canada who agree to participate will be involved.



Sharon Warren is eager to solve the puzzle of higher MS rates in Alberta.

"In the past there have been problems in getting a large enough sample size for these kinds of studies," Dr Warren says. "With so many people involved in this one, there is quite a bit of hope that we can shed some light on the genetics."

"It's frustrating that, after all these studies, the risk factors are still not well-understood. However, it often takes a long time to solve epidemiological puzzles. My reward comes from trying to contribute to solving the puzzle."

Dr Warren's research has been funded by Medical Services Inc., the National Health Research and Development Program, and Alberta Friends of Multiple Sclerosis. ▮

Turning on to fitness

Finding the right motivation



Len Wankel is looking for ways of motivating people to adopt active living.

When physical education professor Len Wankel was teaching high school, he couldn't help but notice which students were most active in sports. They were not the kids who needed the physical activity the most — the Grade Nines who were awkward and perhaps a bit overweight. These tended to shy away from gym classes and extracurricular sports. Instead, the active ones were the already physically active and skilled children.

This mismatch bothered Dr Wankel. He wanted to find the answer to encouraging more broad-based involvement in physical activity. "I decided to do a Master's degree and study the problem," he recalls. "I figured I'd be back in a year to implement the changes. Well, that was about 25 years ago. I'm still at the University and I'm still looking for the answer!"

Although Dr Wankel says he's been humbled by the realization that there is no one, easy answer, his search has turned up some interesting insights on what is involved in maintaining a healthy, physically active lifestyle. One of the important ingredients is enjoyment.

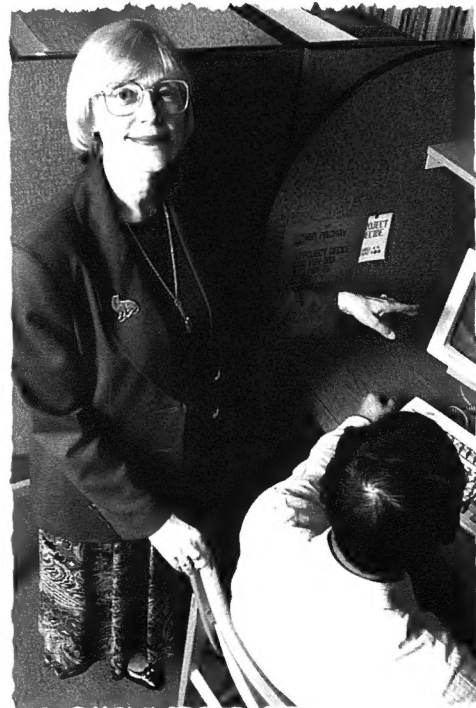
"While we pay lip service to enjoyment, in many cases we do nothing to enhance it," Dr Wankel says. "For example, the leadership practices in many recreational sports undermine enjoyment because they focus too much on a winning outcome."

Despite the fact that everyone's idea of enjoyment is different, Dr Wankel notes that there are some common elements. He lists the "four c's": competence, challenge, choice and control. This means having the

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Expanding job options for the disabled

New test helps people with disabilities make their own choices



Lorraine Wilgosh is giving people with disabilities more control over job selection.

Lorraine Wilgosh's latest research project has its roots in frustration. Since the 1980s, the education professor has investigated the adjustment of families with children who have disabilities. She has looked at how these children function in their schools and communities, and what their job prospects are.

For young people with intellectual impairments, those prospects are not good. About 70 percent are unemployed as adults. "It's not that they are unemployable. For many it's a matter of not having the opportunity to try what they really want to do," explains Dr Wilgosh. "Other people tend to make a guess for them."

It was clear to Dr Wilgosh that improving job prospects for young people with intellectual impairments entailed improving the tests used to determine their vocational preferences. The typical test is done with paper and pencil; line drawings depict the various jobs.

"The problem with this kind of test is that people with intellectual impairments may have somewhat limited reading and writing skills. A pencil and paper test is not well-suited to them," Dr Wilgosh says. "As

well, the line drawings portray a static image of a job, one that young people find difficult to relate to. I felt we could do better."

The result is an audio-visual vocational preferences test. The current version runs on a VCR and features a number of entry level jobs in areas such as food preparation, materials handling (bottle depot worker, stock clerk) and janitorial work. The video portrays four different skills within each job. The jobs are shown sequentially; job preferences are made between sets of two jobs shown on a split screen.

Filming was done on location to give viewers an idea of the work environment as well as the actual job tasks. The people demonstrating the jobs are not disabled. Dr Wilgosh says this is an important point, so viewers do not get the impression that these jobs are only for people with disabilities.

The video has been tested on hundreds of high school students and young adults in Alberta. The feedback has been very positive. Since Dr Wilgosh presented her preliminary data at an international conference on mental retardation in Hong Kong, requests for the video have been flooding in from around the world. An interactive computer-based version is under development now.

"People with disabilities are being left out. This project has potential to facilitate appropriate job training and make a real difference in people's lives."

"I think the most gratifying part of this work is seeing something that began as an abstract idea become a practical, useful tool," Dr Wilgosh says. "At a time when there's so much emphasis on job training, people with disabilities are being left out. This project has potential to facilitate appropriate job training and make a real difference in people's lives."

Dr Wilgosh has received funding from the Central Research Fund and the Support for Advancement of Scholarship program. ▬

There's no need to suffer from depression

Research has clinical applications

There's depressing news about depression. While studying the prevalence of mental disorders in Edmonton, psychiatry professors Roger Bland and Stephen Newman found more than half the people suffering from major depressive disorder did not get help. They chose to suffer alone.

"This is really a very disturbing finding," says Dr Bland. "It's not just the suffering caused by depression, there's increased mortality, too. Many people who suffer from depression consider it their lot to have a miserable life. Others are continually told by friends and family to 'snap out of it.'"

There is help — in the past 10 years there have been advances in treatment. However, if people don't get to treatment, it doesn't matter how good a job doctors can do. Information on how and when people seek treatment for psychiatric illnesses can be used to design more effective public awareness campaigns," says Bland.

Collecting data on these illnesses required a combination of expertise in psychiatry (Dr Bland's speciality) and epidemiology (Dr Newman's speciality). The survey by Drs Bland and Newman is one of the most comprehensive of its kind in Canada. Rather than focus on people who had already sought medical help, the research team randomly selected households in Edmonton, about 11,000 people in all.

Their questionnaire was designed to identify if people had experienced any of about 20 major psychiatric disorders.

"I'm a naturally curious person and, since I'm a psychiatrist, it just follows that I'm interested in the nature and distribution of psychiatric disorders," Dr Bland says. "But the problem is the data in this area have been very, very poor. We couldn't even ask simple questions about how common or rare certain disorders are."

With a phenomenally high response rate of 75 percent, the survey was a trove of useful data. The results allowed the research team to identify the extent of mental illness, chart how disorders run in families and track how people seek out specialized care.

Some results illuminate differences between the sexes. While rates for psychiatric disorders in men and women are similar, they do get different types of disorders. Women tend to get depressed and seek medical help. Men, on the other hand, are more likely to become alcoholics, turn to crime and land in jail. "As a result, men tend to get the thin edge of the wedge in terms of treatment," notes Dr Bland.

The researchers also found that one psychiatric disorder means there is an increased likelihood of having further disorders. "Clinicians tend to focus on what they see first and elaborate on that. They cease to look for



Roger Bland channels his natural curiosity into the nature and distribution of psychiatric disorders.

additional disorders," Dr Bland explains. "Our study shows it's critical to have broad screening for other disorders. We can implement this in mental health clinics and have an immediate effect on patient care."

"This is the kind of research I enjoy most — it satisfies my curiosity and has

applications to patients."

The research done by Drs Bland and Newman is supported by the Alberta Heritage Foundation for Medical Research, the Alberta Mental Health Research Fund and the National Health Research and Development Program. ▬

Genetics is a waiting game

New technologies help map genes

For genetics professor Allen Good, many experiments involve waiting. But it's not just waiting for results; it's waiting for technology to develop and waiting for his lab to become proficient in using the new technologies in plant genetics.

"If all my experiments proceeded as fast as I can think them up, I'd be way ahead of where I am now," says Dr Good. "Still, it's an exciting time to be in genetics, because we now have ways of asking questions that weren't available 10 years ago."

An example is Dr Good's research on drought and flood tolerance in plants. "There is a lot of evidence that, if you put a plant through a stress like a drought or flood, it will adapt," he explains. "I'm interested in finding out what is the physiological basis of this adaptation."

Understanding the genetics of adaptation to stress depends on being able to pull genes out of plants and characterize them, then put specific genes back in to see what effect they have. "It's been relatively easy to get genes out. However, putting them back in — creating what are known as transgenic plants — has taken longer to develop," says Dr Good. "In our lab, we're getting ready to do this now. We'll be able to test the theories we have in a way we could not have done before."

The expertise in gene mapping that Dr Good developed on the stress adaptation research is now being put to use on another project. It will support the University's major research program on developing new varieties of canola. Dr Good is working with Dr Gary Stringam, a canola breeder at the University.

On this project, Dr Good's research team will be mapping canola genes, trying to find the genetic basis of desirable characteristics such as disease resistance.



For Allen Good, the longest wait is for technology, not plants, to develop.

canola work, we will be looking for genes that cause known effects. These are two different approaches to genetics research, but they dovetail nicely. I'm optimistic that favourable results will come from this work."

One set of genes that interests canola breeders are genes for resistance to the flea beetle, a common pest of canola. Wild plants in the canola family are resistant to this pest, while canola itself is highly susceptible.

"Engineering a flea beetle-resistant canola would cut crop losses and decrease the amount of insecticide currently used on canola," Dr Good says. "We are mapping genes that are not only agronomically important, they are also environmentally important. This is a great opportunity to do interesting work that is useful, too."

Dr Good's research is supported by the Natural Sciences and Engineering Research Council, and Alberta Agriculture's Farming for the Future program. ▬

Mountain town with a vision

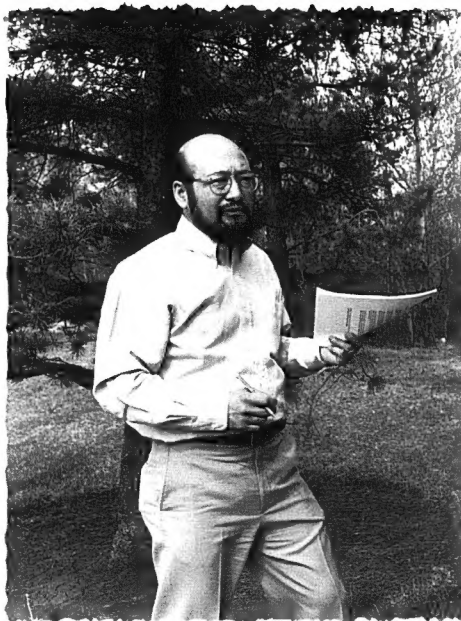
Helping communities interact with protected areas

It was pure coincidence that led extension professor Albert Einsiedel to his latest research topic. In 1992, the social psychologist was presenting a conference paper on protected areas management. Dr Einsiedel's particular interest is the interface between parks and communities. It is his contention that when we talk about ecosystems, we must include human communities.

It so happened that a representative of the U.S.-based Earthwatch organization was in the audience that day. (Earthwatch funds research aimed at improving our understanding of the planet, the diversity of its inhabitants and the processes that affect quality of life.) She suggested Dr Einsiedel submit a research proposal.

The encounter set the wheels in motion and, in 1993, Dr Einsiedel and principal investigator Jenny Feick from Parks Canada began the "Mountain town with a vision" project.

The mountain town is Revelstoke, B.C., a community of about 8,000 people adjacent to Mount Revelstoke and Glacier National Parks. It has experienced a boom-and-bust economy based on resource exploitation. Today, there are plans to develop the tourism industry. One scenario involves a huge \$580-million ski resort, a development that would radically change the small alpine community.



Albert Einsiedel believes human communities must be included in talk about ecosystems.

"Throughout the world there are many communities like Revelstoke," Dr Einsiedel says. "They are struggling to find ways to enhance their quality of life, preserve the small-town atmosphere, gain prosperity and restore lost beauty. And they're doing this in very difficult economic times. Trade-offs have to be made."

For Revelstoke, the struggle was evident in the drafting of a vision statement for the community. The result of widespread public input and participation, the statement expresses the town's desire to balance economic, social and environmental values. Dr Einsiedel's research project documents the process Revelstoke used to develop and achieve its vision, and identifies the

citizens' own indicators of success in becoming a sustainable community.

"I feel there is a lesson to be learned from communities with a vision," says Dr Einsiedel. "We did our study to determine how they articulated the vision in Revelstoke, who the players and leaders were, what the dynamics among stakeholders are, how they work together, how they commit to the vision and what actions result."

Through surveys and interviews of individuals and groups, the project examined relationships between variables such as lifestyle and length of residency, and support for the vision. Several research teams, made up of local volunteers and some of Earthwatch's 35,000 international EarthCorps volunteers, carried out the work.

"This kind of research is not dependent on the skills of an academic researcher like myself," notes Dr Einsiedel. "The expertise needed here is actually in the community. The academic expert is more of a facilitator, helping define the research issues and the appropriate research methodology."

"It's good science and it has the added value of the people in the community — people who are not seen as objects of the study but who are part of the research organization itself. It's an innovative and, at times, controversial approach to social science research."

Major funding for this project was provided by Earthwatch's Center for Field Research. Other support came from Parks Canada, Environment Canada, Okanagan University College, the City of Revelstoke and the Revelstoke Community Futures Society. □

Wankel

Continued from page 3

appropriate skills, setting a task that is suitable to the individual's ability, being offered a variety of activities and social settings, and being in control of whether or not, when and where, one does the activity. "Put these four elements together and you have a greater commitment to physical activity," Dr Wankel says.

His research has also shown that different factors influence commitment at different times. For example, adults usually begin to be physically active for a health reason. However, once the activity is started, the health reason is not as important to maintaining the activity. Enjoyment, not only of the activity itself but of its physical environment and social setting, begins to figure

prominently in determining whether people continue being active.

Given the mounting evidence that a sedentary lifestyle is not good, the consequences of having children and adults "turn off" of physical activity could be

"We're moving towards the concept of 'active living', where the emphasis is on integrating physical activity into our daily lives."

very serious. "Regular physical activity is important to the prevention of, and rehabilitation from, diseases such as heart disease, stroke and some kinds of cancer," says Dr Wankel. "There are also psycho-

logical benefits including reduced anxiety, increased self-esteem.

"We're moving towards the concept of 'active living', where the emphasis is on integrating physical activity into our daily lives. That might mean walking or biking to work, or choosing to take the stairs rather than the elevator. To achieve this we need to foster skills and patterns of living that will be sustained."

Dr Wankel and his graduate students use the Theory of Planned Behavior and the Transtheoretical Model of Behavior Change to investigate the process of being physically active. They employ a variety of research methodologies ranging from individual case studies to national surveys.

Dr Wankel's research is supported by the Canadian Fitness and Lifestyle Research Institute; the Recreation, Parks and Wildlife Foundation; and the University's Central Research Fund. □

The articulate 18th century gesture

Body language is the key to appreciation

The arch of an eyebrow, the curl of a lip, the wink of an eye — gestures like these can tell us as much about what's going on in a person's mind as a couple of hundred words of description.

Many eighteenth-century authors exploited this code to delight and challenge their readers. But much of the meaning in novels such as *Tristram Shandy* and *Camilla* is lost to modern-day readers. Luckily for us, there's a super-sleuth who is intent on cracking the code — English professor Juliet McMaster.

"My interest is in the ways writers of this period use physical signs of the body as a code by which readers can interpret the motions of the mind," explains Dr McMaster. "Eighteenth-century novels are full of encoded information. There is a whole range of signs you can recover if you know what you're looking for."

Dr McMaster is exploring these signs in her current research project, a book tentatively titled *The Body Legible*. Understanding the code used by eighteenth-century novelists involves reading widely in a number of areas: medical texts, treatises on art, and actors' manuals.

For example, medical theory of the day contained the idea that character is determined by physical make up. "Sickness and

health were deemed to be linked to mental and moral conditions," Dr McMaster says. "Disease in the novel is never morally neutral."

There was also the well-developed "science" of physiognomy, by which one could read the mind in the face. In the eighteenth century, there was a lively debate on how permissible it was to judge moral character by the length of a man's nose or the curve of a woman's lips.

The analysis of body was not limited to stable character, but also extended to passing emotions. The French painter Charles Le Brun published a treatise on how to "design the passions" in representing the face. Dr McMaster notes that Samuel Richardson, author of *Clarissa*, was well versed in Le Brun's theory.

"Richardson's novels, which are minutely specific about facial expressions and gestures of the hands, come alive in a new way when one reads with these doctrines in mind," she says. "The authors of that time were learned in these discourses, and they used the signs intentionally to see how much their audience could recover."

Although physiognomy is long past being an accepted scientific doctrine, Dr McMaster says it's a mistake to think we've entirely abandoned these outdated



For Juliet McMaster, gestures make 18th-century novels come alive.

notions. Much of the code is with us in popular lore. Think about that the next time you see a person with beady eyes...

Dr McMaster's research has been supported by a Killam Research Fellowship. She is also a winner the prestigious Canada Council Molson Prize. The prize recognizes outstanding lifetime contributions to the cultural and intellectual life of Canada. ─

Hormone linked to hypertension

Calcium research leads to discovery

For the 60 million North Americans who have high blood pressure, there is hope that a more scientific approach to treatment is on the way. In labs like the one run by physiology professor Peter Pang, researchers are gaining greater understanding of what causes hypertension and they are finding natural substances in the body that control it.

The benefit of all this? "Safer, more logical treatments for hypertension," Dr Pang says. "If we understand the disease, it's possible to take a rational approach to treatment instead of the trial-and-error approach, where we try a drug to see if it works. If it doesn't, we try another one."

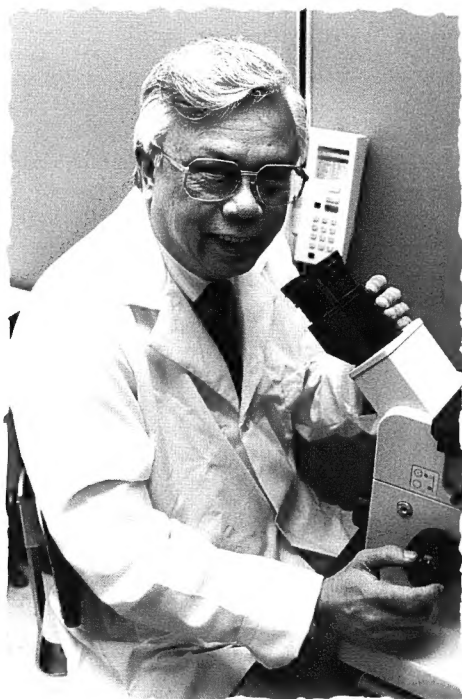
The story of hypertension begins with calcium. The body's calcium regulation system must maintain tight control over the amount of calcium inside cells. Although cell membranes are relatively impermeable, there are channels that let calcium in and

out. When regulation goes awry, too much calcium can be allowed into cells. When the build-up occurs in vascular smooth muscle cells, it leads to excessive constriction of blood vessels and higher blood pressure.

Recently, an important discovery about calcium regulation was made in Dr Pang's lab. His research team discovered a hormone — parathyroid hypertensive factor (PHF) — that opens calcium channels, allowing more calcium into cells and raising blood pressure. PHF is likely the cause of about 30 to 40 percent of hypertension cases.

Dr Pang notes that, although the PHF discovery may appear to be a recent, isolated event, its roots are in the development of the tools and expertise necessary to study hypertension at the cellular level. One essential ingredient was developing the technologies needed to measure the minute concentrations of calcium within

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Peter Pang looks for the calcium connection to hypertension and other diseases.

Team approach vitalizes diabetes research

U of A Centre of Excellence builds on tradition

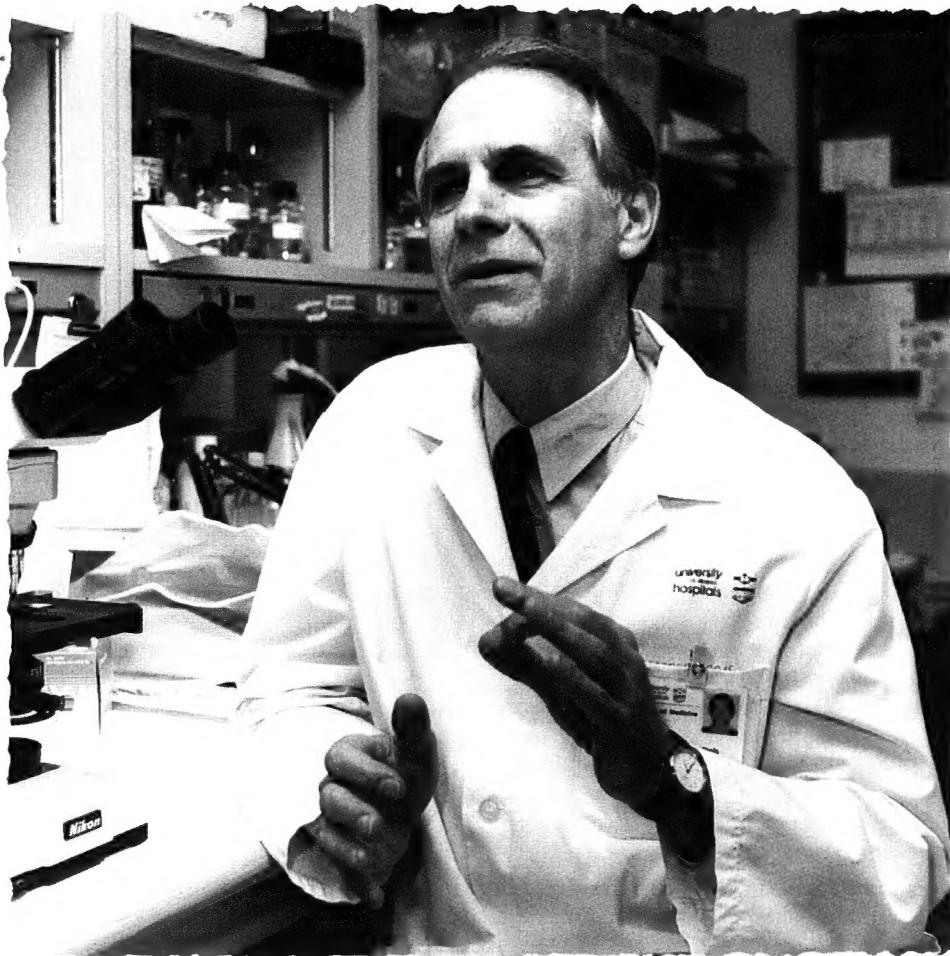
Excellence doesn't happen overnight. The University of Alberta was very honoured when the Juvenile Diabetes Foundation International (JDFI) selected it as a Centre of Excellence in Diabetes Research. It was a testament to both the University's long history of achievements in diabetes research and its current research program led by world-class scientists.

"The team approach is absolutely vital to our work," says Alex Rabinovitch, director of the Centre and professor of medicine and immunology. "In the Centre, we've brought together a group of nine individuals, experts in their own areas of medical science. In getting together, there's a synergy — the whole is greater than the sum of its parts."

"Research is never done in a vacuum," says Dr Rabinovitch. "It's all about networking which includes meetings in corridors, scheduled rounds and formal scientific conferences. Programs like the one run by the JDFI accelerate the networking. Research is sequential detective work. We're a collection of detectives sharing clues from the field."

The focus of research at the Centre is insulin-dependent diabetes, an autoimmune disease in which the body's immune system mistakenly attacks its own insulin-producing islet cells in the pancreas.

The researchers' goal is twofold: prevent insulin-dependent diabetes by modulating the immune response, and use islet cell transplants to treat patients whose islets have already been destroyed. (Three members of the Centre, Drs Ray Rajotte, Garth Warnock and Norm Kneteman, were responsible for one of the world's first successful transplantations of islets in diabetic patients.)



Alex Rabinovitch believes in the synergy of the team approach to research.

In his own research, Dr Rabinovitch is attempting to understand the immune response involved in insulin-dependent diabetes. It's a complicated task, because a diabetic's islet cells are attacked by various kinds of cells in, and cell products of, the immune system. The first order of business is to sort out all the components of this complex system, then determine what sets them off on a destructive path.

In recent experiments on diabetic mice and rats, Dr Rabinovitch's team found that some microbial agents — extracts of bacteria — often have a protective action against diabetes development. These agents appear to stimulate the animals' own immune systems to produce mediators, such as interleukins, which suppress the autoimmune response

that leads to insulin-dependent diabetes.

"The exciting part about this discovery is the clinical implication," Dr Rabinovitch explains. "The experimental results indicate that certain interleukins could be used in patients to suppress the autoimmune response and block the development of diabetes. Of course, there's a way to go from mice to people, but this is a promising start."

Dr Rabinovitch's research is supported by the Alberta Heritage Foundation for Medical Research, the Juvenile Diabetes Foundation International, the Medical Research Council, the Muttart Diabetes Research and Training Centre, and the MacLachlan Fund of the University Hospitals Foundation.┐

Pang

Continued from previous page

cells and to track calcium as it moved in and out of cells. The other key component was assembling a team of researchers, in particular Drs Christine Benishin, Richard Lewanczuk and Jie Shan.

"It took eight years to get to the point where we can study a physiological event in tissues, cells and at the molecular level,

ask specific questions, and look at what's going on," explains Dr Pang.

While his work on hypertension continues, Dr Pang's curiosity about calcium regulation may lead to insights about other diseases as well. It's probable that calcium build-up affects cells other than those in blood vessels. Consequently, PHF and calcium regulation defects may be involved in several diseases. Dr Pang is eager to pursue that hypothesis.

"Nature is full of surprises, and uncovering them is the fun of research," he says.

"There's nothing comparable to the excitement of discovery. No matter how depressing your day has been, when you find a new thing, that's where the excitement is."

Dr Pang's research is supported by the pharmaceutical industry and the Natural Sciences and Engineering Research Council. Drs Benishin and Lewanczuk receive funding from the Medical Research Council.┐